

47. (New) The isolated polynucleotide of claim 46, wherein said substituted amino acids in said FRs are amino acids identified as potential CDR contacts affecting the affinity and specificity of the encoded LL2 mAb to its antigen.

48. (New) The isolated polynucleotide of claim 46, wherein said substituted amino acid is at least one amino acid position from said mLL2 mAb and is selected from the group consisting of amino acid position 4, 21, 22, 45, 77 and 105 of the murine light chain variable region of SEQ ID NO. 2.

49. (New) The isolated polynucleotide of claim 45, wherein said FRs comprise at least one FR, wherein said FR1 comprises amino acids 1-23 of SEQ ID NO:6, FR2 comprises amino acids 41-55 of SEQ ID NO:6, FR3 comprises amino acids 63-94 of SEQ ID NO:6, or FR4 comprises amino acids 103-113 of SEQ ID NO:6.

50. (New) The isolated polynucleotide of claim 44 encoding the amino acid sequence of SEQ ID NO:6.

51. (New) The isolated polynucleotide of claim 44 comprising the nucleic acid sequence of SEQ ID NO:5.

52. (New) The isolated polynucleotide of claim 44 encoding the amino acid sequence of SEQ ID NO:2.

53. (New) The isolated polynucleotide of claim 44 comprising the nucleic acid sequence of SEQ ID NO:1.

54. (New) An isolated polynucleotide encoding the amino acid sequence of a light chain variable region of an LL2 monoclonal antibody (mAb) or antigen binding fragment thereof, wherein the FRs of the light chain variable region comprises at least one FR, wherein said FR1 comprises amino acids 1-23 of SEQ ID NO:6, FR2 comprises amino acids 41-55 of SEQ ID NO:6, FR3 comprises amino acids 63-94 of SEQ ID NO:6, or FR4 comprises amino acids 103-113 of SEQ ID NO:6, wherein the LL2 mAb retains the immunoreactivity of the mLL2.

55. (New) The isolated polynucleotide of claim 44, wherein said fragments are selected from the group consisting of F(ab')<sub>2</sub>, Fab', Fab, and Fv.
56. (New) An expression vector comprising the polynucleotide of claim 44.
57. (New) A host cell comprising the polynucleotide of claim 44.
58. (New) A host cell of claim 57, wherein said cell is a mammalian cell.
59. (New) A host cell of claim 58, wherein said mammalian cell is a myeloma cell.
60. (New) An isolated polynucleotide encoding the amino acid sequence of a heavy chain variable region of an LL2 monoclonal antibody (mAb) or antigen binding fragment thereof comprising at least one complementarity-determining regions (CDRs) of the heavy chain of a murine LL2 (mLL2), wherein CDR1 comprises amino acids 31 to 35 of SEQ ID NO: 4, CDR2 comprises amino acids 50 to 66 of SEQ ID NO: 4 or CDR3 comprises 99 to 105 of SEQ ID NO: 4, wherein the LL2 mAb retains the immunoreactivity of the mLL2.
61. (New) The isolated polynucleotide of claim 60, wherein said amino acid sequence encoding said heavy chain variable region further comprises framework regions (FRs) of a heavy chain variable region of at least one human antibody.
62. (New) The isolated polynucleotide of claim 61, wherein said FRs comprise at least one amino acid substitution.
63. (New) The isolated polynucleotide of claim 62, wherein said substituted amino acids in said FRs are amino acids identified as potential CDR contacts affecting the affinity and specificity of the encoded LL2 mAb to its antigen.
64. (New) The isolated polynucleotide of claim 63, wherein said substituted amino acid is at least one amino acid position from said mLL2 mAb and is selected from the group consisting of amino acid position 27Y, 30T, 48I, 67K, 68A and 98R of the murine heavy

chain variable region of SEQ ID NO. 4.

65. (New) The isolated polynucleotide of claim 61, wherein said FRs comprise at least one FR, wherein said FR1 comprises amino acids 1-30 of SEQ ID NOS:8 or 9, FR2 comprises amino acids 36-49 of SEQ ID NOS:8 or 9, FR3 comprises amino acids 67-98 of SEQ ID NOS:8 or 9, or FR4 comprises amino acids 106-116 of SEQ ID NOS:8 or 9.

66. (New) The isolated polynucleotide of claim 60 encoding the amino acid sequence of SEQ ID NOS:8 or 9.

67. (New) The isolated polynucleotide of claim 60 comprising the nucleic acid sequence of SEQ ID NO:7.

68. (New) The isolated polynucleotide of claim 60 encoding the amino acid sequence of SEQ ID NO:4.

69. (New) The isolated polynucleotide of claim 60 comprising the nucleic acid sequence of SEQ ID NO:3.

70. (New) An isolated polynucleotide encoding the amino acid sequence of a heavy chain variable region of an LL2 mAb heavy chain, wherein the FRs comprise at least one FR, wherein said FR1 comprises amino acids 1-30 of SEQ ID NOS:8 or 9, FR2 comprises amino acids 36-49 of SEQ ID NOS:8 or 9, FR3 comprises amino acids 67-98 of SEQ ID NOS:8 or 9, or FR4 comprises amino acids 106-116 of SEQ ID NOS:8 or 9, wherein the LL2 mAb retains the immunoreactivity of the mLL2.

71. (New) The isolated polynucleotide of claim 60, wherein said fragments are selected from the group consisting of F(ab')<sub>2</sub>, Fab', Fab, and Fv.

72. (New) An expression vector comprising the polynucleotide of claim 60.

73. (New) A host cell comprising the polynucleotide of claim 60.

74. (New) A host cell of claim 60, wherein said cell is a mammalian cell.
75. (New) A host cell of claim 74, wherein said mammalian cell is a myeloma cell.
76. (New) An isolated polynucleotide encoding the amino acid sequence of a light chain variable region of an LL2 monoclonal antibody (mAb) or an antigen binding fragment thereof comprising at least one complementarity-determining region (CDR) of the light chain of a murine LL2 (mLL2) mAb, wherein CDR1 comprises amino acids 24 to 40 of SEQ ID NO: 2, CDR2 comprises amino acids 56 to 62 of SEQ ID NO: 2 or CDR3 comprises 95 to 102 of SEQ ID NO: 2, and encoding the amino acid sequence of a heavy chain variable region of an LL2 monoclonal antibody (mAb) or the antigen binding fragment thereof comprising at least one complementarity-determining regions (CDRs) of the heavy chain of a murine LL2 (mLL2), wherein CDR1 comprises amino acids 31 to 35 of SEQ ID NO: 4, CDR2 comprises amino acids 50 to 66 of SEQ ID NO: 4 or CDR3 comprises 99 to 105 of SEQ ID NO: 4, wherein the LL2 mAb retains the immunoreactivity of the mLL2.
77. (New) The isolated polynucleotide of claim 76, wherein said amino acid sequence encoding said light chain variable region and said heavy chain variable region further comprise framework regions (FRs) of a light chain variable region and heavy chain variable region of at least one human antibody.
78. (New) The isolated polynucleotide of claim 77, wherein said FRs of the light chain variable region and the heavy chain variable region comprise at least one amino acid substitution.
79. (New) The isolated polynucleotide of claim 78, wherein said substituted amino acids in said FRs are amino acids identified as potential CDR contacts affecting the affinity and specificity of the encoded LL2 mAb to its antigen.
80. (New) The isolated polynucleotide of claim 79, wherein said substituted amino acid from said light chain variable region of said mLL2 mAb is at least one amino acid position selected from the group consisting of amino acid position 4, 21, 22, 45, 77, and 105 of the murine light chain variable region of SEQ ID NO. 2, and wherein said substituted amino acid

from said heavy chain variable regions of said mLL2 mAb is at least one amino acid selected from the group consisting of amino acid residue 27, 30, 48, 67, 68 and 98 of the murine heavy chain variable region of SEQ ID NO. 4.

81. (New) The isolated polynucleotide of claim 77, wherein said FRs of said light chain variable region comprises at least one FR, wherein said FR1 comprises amino acids 1-23 of SEQ ID NO:6, FR2 comprises amino acids 41-55 of SEQ ID NO:6, FR3 comprises amino acids 63-94 of SEQ ID NO:6, or FR4 comprises amino acids 103-113 of SEQ ID NO:6, and wherein said FRs of said heavy chain variable region comprises at least one FR, wherein said FR1 comprises amino acids 1-30 of SEQ ID NOS:8 or 9, FR2 comprises amino acids 36-49 of SEQ ID NOS:8 or 9, FR3 comprises amino acids 67-98 of SEQ ID NOS:8 or 9, or FR4 comprises amino acids 106-116 of SEQ ID NOS:8 or 9, wherein the LL2 mAb retains the immunoreactivity of the mLL2.

82. (New) The isolated polynucleotide of claim 76 encoding the amino acid sequence of SEQ ID NO: 6 and SEQ ID NOS: 8 or 9.

83. (New) The isolated polynucleotide of claim 76 comprising the nucleic acid sequence of SEQ ID NO: 5 and SEQ ID NO: 7.

84. (New) The isolated polynucleotide of claim 76 encoding the amino acid sequence of SEQ ID NO: 2 and SEQ ID NO: 4.

85. (New) The isolated polynucleotide of claim 76 comprising the nucleic acid sequence of SEQ ID NO: 1 and SEQ ID NO: 3.

86. (New) An isolated polynucleotide encoding the amino acid sequence of an LL2 mAb, wherein the FRs of a light chain variable region comprises at least one FR, wherein said FR1 comprises amino acids 1-23 of SEQ ID NO:6, FR2 comprises amino acids 41-55 of SEQ ID NO:6, FR3 comprises amino acids 63-94 of SEQ ID NO:6, or FR4 comprises amino acids 103-113 of SEQ ID NO:6, and encoding the amino acid sequence of an LL2 mAb, wherein the FRs of a heavy chain variable region comprises at least one FR, wherein said FR1 comprises amino acids 1-30 of SEQ ID NOS:8 or 9, FR2 comprises amino acids 36-49 of

SEQ ID NOS:8 or 9, FR3 comprises amino acids 67-98 of SEQ ID NOS:8 or 9, or FR4 comprises amino acids 106-116 of SEQ ID NOS:8 or 9, wherein the LL2 mAb retains the immunoreactivity of the mLL2.

87. (New) The isolated polynucleotide of claim 76, wherein said fragments are selected from the group consisting of F(ab')<sub>2</sub>, Fab', Fab, and Fv.

88. (New) An expression vector comprising the polynucleotide of claim 76.

89. (New) A host cell comprising the polynucleotide of claim 76.

90. (New) A host cell of claim 89, wherein said cell is a mammalian cell.

91. (New) A host cell of claim 90, wherein said mammalian cell is a myeloma cell.

92. A method for the expression of a light chain variable region of an LL2 monoclonal antibody (mAb) or antigen binding fragment thereof comprising:

- (a) transfecting a mammalian cell with the polynucleotide of claim 44; and
- (b) culturing said cell secreting said light chain variable region of an LL2 mAb or said fragment thereof.

93. A method for the expression of a heavy chain variable region of an LL2 monoclonal antibody (mAb) or antigen binding fragment thereof comprising:

- (a) transfecting a mammalian cell with the polynucleotide of claim 60; and
- (b) culturing said cell secreting said LL2 mAb or said fragment thereof.

94. A method for the expression of an LL2 monoclonal antibody (mAb) or fragment thereof comprising:

- (a) transfecting a mammalian cell with the polynucleotide of claim 76; and
- (b) culturing said cell secreting said LL2 mAb or said fragment thereof.